

PENNSYLVANIA RAILROAD, BRILLIANT CUT-OFF, SOUTH WYE
Pennsylvania Historic Railroad Bridges Recording Project
Linden Ave. at Frankstown Ave.
Pittsburgh
Allegheny County
Pennsylvania

HAER No. PA-555

HAER
PA
2-PITBU,
75-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
1849 C Street, NW
Washington, DC 20240

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Location: Linden Ave. at Frankstown Ave., Pittsburgh, Allegheny County, Pennsylvania.

USGS Quadrangle: Pittsburgh East, Pennsylvania (7.5-minute series).

UTM Coordinates: 17/592830/4479400

Dates of Construction: 1902-03.

Basis for Dating: Secondary sources.

Designer: Pennsylvania Railroad: William H. Brown, Chief Engineer; E. B. Temple, Assistant Engineer.

Builder: Columbia Contracting Co.

Present Owner: Norfolk Southern Railroad.

Present Use: Railroad bridge.

Structure Type: Stone arch.

Significance: This structure is significant for its association with the Pennsylvania Railroad's Brilliant Cut-Off, a bypass through residential neighborhoods around downtown Pittsburgh. The elevated south wye ("Y"-shaped) junction, which consists of two curved stone arch viaducts, is an unusual example of the type.

Historian: Justin M. Spivey, April 2001.

Project Information: The Historic American Engineering Record (HAER) conducted the Pennsylvania Historic Railroad Bridges Recording Project during 1999 and 2000, under the direction of Eric N. DeLony, Chief. The project was supported by the Consolidated Rail Corporation (Conrail) and a grant from the Pennsylvania Historical and Museum Commission (PHMC). Justin M. Spivey, HAER engineer, researched and wrote the final reports. Preston M. Thayer, historian, Fredericksburg, Virginia, conducted preliminary

research under contract. Jet Lowe, HAER photographer, and Joseph E. B. Elliott, contract photographer, Sellersville, Pennsylvania, produced large-format photographs.

Description and History

From 1902 to 1904, the Pennsylvania Railroad (PRR) drove its Brilliant Cut-Off through East Liberty and Highland, two residential neighborhoods in northeastern Pittsburgh. The expensive three-mile route, which cost \$3.5 million for property acquisition and grading, followed the ravine occupied by Washington Boulevard, a thoroughfare in Highland Park.¹ The line crossed the Allegheny River at Aspinwall to connect with the West Penn Railroad. Along with the earlier Ohio Connecting Railway route across Brunot's Island, the Brilliant Cut-Off formed a belt line around the city. According to *Railway Age*, PRR intended the four-track Brilliant Cut-Off "to relieve the frequent and embarrassing congestions of its freight traffic in and around Pittsburgh."² This was but one element in a massive program of improvements proposed by PRR President Alexander J. Cassatt in 1902, which also included four-tracking of the railroad's main line across Pennsylvania, separating passenger and freight traffic around Philadelphia, and reducing grades throughout the state.³

With the exception of two-track Parker trusses across the Allegheny River, most structures on the Brilliant Cut-Off are four-track stone arch bridges. When first announcing plans for the line, *Railway Age* indicated that PRR might use either steel or stone arch construction, although "it is probable that the stone arch will be selected."⁴ There are several reasons for this, with PRR Chief Engineer William H. Brown's preference for "permanent" construction most prominent among them. Although stone arch construction was more labor-intensive than steel, PRR's strong financial position at the turn of the twentieth century allowed management to justify more expensive construction with long-term maintenance savings. Brown had designed stone arches as early as 1887 at Johnstown, but it was a flurry of masonry construction between 1900 and 1906 that earned him a reputation as the railroad's "stone man."⁵ Another reason for stone arch structures on the Brilliant Cut-Off may have been aesthetic concern for Highland Park and residential neighborhoods along the line. In describing the stone arch viaduct across Silver Lake, *Railway Age* referred to its popularity for ice skating in winter.⁶

In order to connect with PRR's main line, which runs on an elevated alignment through Homewood and East Liberty, the south end of the Brilliant Cut-Off had to be elevated as well. The wye ("Y"-shaped) junction between the cut-off and main line consists of two curved stone arch viaducts, carrying two tracks each. The south wye viaducts are of similar construction to other stone arch structures on the cut-off, with arch rings of Clearfield County sandstone and concrete backing. To accommodate the curvature, Assistant Engineer E. B. Temple designed wedge-shaped piers instead of varying the arches' width. This device previously had been used on one of America's earliest stone arch railroad bridges, the Baltimore & Ohio Railroad's Thomas Viaduct (1833-35).⁷ While not strictly innovative, the south wye of the Brilliant Cut-Off remains an unusual and impressive example of stone arch construction.

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HAER No. PA-555
(Page 3)

Notes

1. "The Brilliant Cut-Off of the Pennsylvania R. R.," *Engineering Record* 51, No. 18 (6 May 1905): 529.
2. "The Brilliant Cut-Off of the Pennsylvania Railroad at Pittsburg," *Railway Age* 36, No. 16 (16 Oct. 1903): 496.
3. Howard W. Schotter, *The Growth and Development of the Pennsylvania Railroad Company: A Review of the Charter and Annual Reports of the Pennsylvania Railroad Company 1846 to 1926* (Philadelphia: Press of Allen, Lane, and Scott, 1927), 281-82.
4. "The Pennsylvania Low-Grade Line and Cut-Offs," *Railway Age* 35, No. 12 (20 Mar. 1903): 463.
5. See U.S. Department of the Interior, Historic American Engineering Record (HAER) No. PA-517, "Pennsylvania Railroad, Conemaugh River Viaduct," 2001, Prints and Photographs Division, Library of Congress, Washington, D.C.
6. *Railway Age*, "The Brilliant Cut-Off," 500.
7. "Thomas Viaduct," in *Capital IA: Industrial Archeology of Washington, D.C.*, edited by Sara Amy Leach (Washington, D.C.: Montgomery C. Meigs Original Chapter, Society for Industrial Archeology, 2001), 72.

Additional Source

1. Eric DeLony, "Penn RR: Stone Arch Bridge," Allegheny County, Pennsylvania, Historic American Engineering Record (HAER) Inventory Form, 1967, Record Group 515, National Archives, Washington, D.C.